

ABSTRACT

Synthesis of a chemical compound having the formula A-B-C that may serve for applications such as drug delivery where A is a chemiluminescent, moiety, B is a photochromic moiety, and C is a biologically active moiety where A-B-C may serve as a prodrug. Novel synthetic methods of the present invention to form the prodrug comprised the steps of (1) forming a benzophenone, (2) forming a diaryl ethylene, (3) attaching a phthalimide moiety to at least one of the aryl groups of the ethylene to form a phthalimide-ethylene conjugate, (4) condensing two ethylene-phthalimide conjugates to form a phthalimide-pentadiene conjugate, (5) converting the phthalimide to the phthalhydrazide by reaction with hydrazine to form a carrier compound according to the present invention, and (6) reacting the carrier compound with an nucleophilic moiety of the drug to form the corresponding prodrug. Alternatively the carrier can be prepared by using the halo-substituted diaryl ethylene to make the corresponding cationic leuco dye-like compound with known methods. The cationic compound then is protected by reacting with a nucleophile and coupled with the aminophthalimide by palladium-catalyzed amination to form the protected phthalimide-pentadiene conjugate. The latter is refluxed with hydrazine to convert its phthalimide to the phthalhydrazide and acidified to give the carrier. An additional aspect of the present invention relates to the use of these compounds as antiviral agents for the treatment of viral infections such as HIV and as anticancer agents for the treatment of cancers such as bowel, lung, and breast cancer.